

## APPARATUS AND METHODS FOR MAGNETIC THROUGH-SKIN SENSING

### ABSTRACT OF THE DISCLOSURE

Apparatus and methods for magnetic through-skin sensing are disclosed. In one embodiment, a sensing system includes a first portion including a magnet having, and a  
5 second portion including a magnetic field sensor. The magnet has a magnetic field emanating therefrom. A field-directing member provides a shaped magnetic field portion of the magnetic field, the shaped magnetic field portion at least partially extending through the workpiece. The magnetic field sensor is moveable through at least a portion of the shaped magnetic field portion. The magnetic field sensor senses a characteristic of the shaped  
10 magnetic field portion indicative of the desired position for the manufacturing operation.